Appendix G.
Development of a Target Compound List (TCL)

G-1. Introduction

The two most common purposes for performing air monitoring at HTRW sites are to (1) provide information on HAPs concentrations for use in a site's overall hazard assessment and (2) assess the status of compliance with applicable Federal, state and local air pollution regulations. Both of these purposes can have a significant influence on the selection of sampling methods and the design of sampling programs.

As discussed earlier, CERCLA requires that a hazard assessment be performed at both Superfund and Corps HTRW sites, including an evaluation of the inhalation route of exposure. The usual approach for performing a hazard assessment is to make use of "risk assessment" techniques. The EPA's Superfund Public Health Evaluation Manual defines an acceptable level of cancer risk as being in the range of 10^{-7} to 10^{-4}. The EPA defines this as the acceptable level of risk for an adult exposed to maximum predicted ambient air concentration for a 70-year period, 24 hours per day. A 10^{-7} risk is a 1-in-10-million chance of death from cancer, whereas a 10^{-4} risk is a 1-in-10 thousand chance of death from cancer. Consequently, an FFMS at an HTRW site must be capable of measuring fenceline contaminant concentrations corresponding to risks within the 10^{-7} to 10^{-4} range.

In addition to the need for performing risk assessments, air sampling may also be required to determine the status of the HTRW site and its compliance with applicable regulations, defined in CERCLA as "applicable or relevant and appropriate" requirements (ARARs). An ARAR is a promulgated regulatory requirement at either the state or Federal levels of government (e.g., a National Ambient Air Quality Standard or a state air emission standard). ARARs apply to emissions from the HTRW site itself as well as to emissions from any remedial operations at the site.

In addressing the regulatory needs of the state agencies, EPA found a need to assist remediation programs in the identification of most probable analytes found at Superfund and HTRW sites. The objective of EPA developing a target compound list (TCL) was to help prioritize analytes of concern so applicable sampling and analytical methods could be identified and used in quantitating emissions to 10^{-6} risk levels.

Since no generally accepted list of HAPs existed, EPA developed a master list based upon the Hazardous Substances Priority Lists (HSPLs) and augmented with 60 additional HAPs selected from other authoritative lists (e.g., the Superfund Public Health Evaluation manual, the California Air Resources Board list of carcinogens, and lists published by the USEPA Office of Air Quality Planning and Standards).

After the master list was compiled, a simple scheme to rank these analytes in order of importance as HAPs at Superfund and HTRW sites was developed. The most important factors considered in developing this scheme were:

- Health effects of the analyte.

- EPA, Corps, and state needs for regulating the analyte.
- Regulatory importance of the analyte.
- Potential for human exposure during site activities.
- Availability of sampling/analytical methods and reference standards for quantitating the analyte.

G-2. Health Effects

In considering health effects, a toxic compound list developed by EPA's Pollutant Assessment Branch (PAB) was used. This list is maintained within EPA's Office of Air Quality Planning and Standards (OAQPS). PAB also maintains a separate list of compound involving "cancer potency slopes" which in most cases are based upon the ingestion route of exposure. Because in many cases these cancer potency slopes have been, and will continue to be, converted to inhalation factors for use in HAPs risk assessments, these data were included in the assessment and ranking of health effects.

For noncarcinogens, lists maintained by EPA's noncarcinogen workgroup were used. These are compounds for which EPA has determined a need for the development of "reference dose" (RfD) values. RfD's are used by EPA as threshold values in evaluating noncarcinogenic health effect. For other compounds on the list which were not described by any of the above date, various health effects indicators such as threshold limit values, and as a last resort, reportable quantity date from SARA Title III, were relied upon.

G-3. EPA, Corps, and State Needs

In assessing EPA, Corps, and state needs for sampling guidance and analytical methods for specific HAPs, a questionnaire was developed and sent to interested parties to determine important HAPs of concern. The respondents provided lists of important HAPs, and the frequency with which specific compounds were of interest.

The response from the questionnaire was supplemented by a data base developed by the National Air Toxics Information Clearinghouse as an indicator of State regulatory activity for specific HAPs. For the various States regulating on the basis of acceptable ambient levels (AALs), the frequency of occurrence of regulations for specific chemicals was the third most important ranking criterion.

G-4. Regulatory Lists

Frequency of occurrence on lists of hazardous materials was also considered to be a useful ranking indicator. The California Air Resources Board (ARB) publishes a "Lists of Lists" which shows the frequency with which specific chemicals are listed in 12 authoritative lists of HAPs. The New York Air Guide II also categorizes specific air toxics compounds as high, medium, or low toxicity. SARA Title III, Section 313, also lists hazardous pollutants. Frequency of occurrence in each of these lists was used as an indicator of the relative importance of these compounds.

G-5. Potential for Human Exposure

Indicators for the potential for human exposure were incorporated by considering both the frequency of occurrence at Superfund and HTRW sites and the volatility of each of the listed compounds. Frequency of occurrence at Superfund sites was obtained directly from the August 1988 list entitled "Frequency Distribution of Substances Present at Final and Proposed NPL Sites." A volatility ranking number between 0.5 and 3 for each compound was derived from boiling point and/or vapor pressure data, as available. These indicators are generally considered to represent the potential for human exposure through the air pathway at Superfund sites.

G-6. Availability of Analytical Methods and Reference Standards

To complete the ranking process, each of the candidate chemicals on the expanded master list was entered into a Lotus 1-2-3 spreadsheet and arrayed with corresponding numerical data describing each of the 10 ranking criteria. A ranking index algorithm (RIA) was devised which would position the maximum value of each of the ranking criteria terms in its relative weighted position. The algorithm for ranking of the target compounds is:

$$RIA = 10G + 11.3B + 120M + 7.5D + 23.3F + 10K + 20L + 40E + 35C + 15J$$

Explanation of the development and derivation of term values can be found in Chapter 3.

As illustrated in Chapter 3, the RIA was designated as the sum of the descriptors terms. The complete target compound list developed for the Corps and EPA nationwide for Superfund sites utilizing the above algorithm consist of approximately 257 target compounds. Of the 257 compounds, 43 percent are volatiles thus having vapor pressure greater than 0.1 mm Hg. Approximately 32.4 percent of the target compound list are classified as semi-volatiles with vapor pressure ranging from 10^{-1} to 10^{-7} mmHg. Finally, metals comprise approximately 28 percent of the target compound list. The full target compound list of 257 compounds, marked in importance as determined by the RIA, is provided below in Table G-1.

Table G-1. EPA's Superfund Target Compound List (TCL)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(UG/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD^{-2} (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
1	*Vinyl Chloride	+	V	+,N	C-GC/MS		0.42	(a)			$4.2x10^{-5}$	.023/0.008998	0.0460/0.0180
2	*Trichloroethylene	+	V	+,N	T/C-GC/MS		0.47	0.08			$1.3x10^{-6}$	.769/0.1431	1.5380/0.2862
3	*Cadmium	+	M	N,NT	F-ICAP, F-XR				0		$1.8x10^{-3}$	.00055/0.0001196	0.0012/0.0003
4	*Chloroform	+	V	+,N	T/C-GC/MS		0.37	0.23			$2.3x10^{-5}$	.043/0.008806	0.0860/0.0176
5	*Benzene	+	V	+,N	T/C-GC/MS		0.53	2.6			$8.3x10^{-6}$	.12/0.03756	0.2400/0.0751
6	*Carbon Tetrachloride	+	V	+,N,F7	T/C-GC/MS		0.41	0.17			$1.5x10^{-5}$	.067/0.010648	0.1340/0.0213
7	*Arsenic	+	M	N,NT	F-ICAP, F-XR				0		$4.3x10^{-3}$	.00023/0.0000751	
8	*Tetrachloroethylene	+	V	+,N	T/C-GC/MS		0.57	2.6			$9.5x10^{-7}$	1.05/0.15479	2.1000/0.3096
9	*Chromium	+	M	N,NT	F-ICAP				0.002		$1.2x10^{-2}$	.000083/0.000039	0.0002/0.0001
10	Mercury	+	M	N,NT	F-ICAP, CV-AA, ACM				0.008				0.0118/0.0014
11	*Beryllium	+	M	N,NT	F-ICAP, F-XR				0		$2.4x10^{-3}$	.0004/0.00108	0.0020/0.0054
12	Selenium	+	M	N,NT	F-ICAP, F-XR				0.001				0.5400/0.1672
13	*Nickel (Subsulfide)	+	M	N	F-ICAP, F-XR		(b)	(a)	0.002		$4.8x10^{-4}$	0.0021	0.0060/0.0025
14	*Heptachlor/heptachlorepoxide	+	P	N,NT	PUF-GC/ECD, PUF-GC/MS					0.01	$1.3x10^{-3}$	.00077/0.0000504	0.002/0.0001
15	1,1-Dichloroethene	+	V	+,N	T/C-GC/MS		0.1	(a)			$5.0x10^{-5}$	.02/0.005044	0.0400/0.0101
16	*Acrylonitrile	+	V	+,F7	T/C-GC/MS						$6.8x10^{-5}$	0.015/0.006912	0.0300/0.0138
17	*Benzo(a)pyrene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, S(XAD^{-2})-HPLC/UV					0	$1.7x10^{-3}$	.00058/0.0000562	1.14/0.1105
18	*1,2-Dichloroethane	+	V	+,N	T/C-GC/MS		0.39	3.8			$2.6x10^{-5}$	0.038/0.0093877	0.0760/0.0188
19	Chlorobenzene	+	V	+,N	T/C-GC/MS		0.48	1.7					10.0/2.1722
20	Lead	+	M	N,NT	F-ICAP, F-XR				0.0187				0.14/0.0165
21	*Formaldehyde	+	V	N	SEP-IC, ACM	0.012	(b)	(c)			$6.1x10^{-6}$	.164/0.13353	0.328
22	1,1,1-Trichloroethane	+	V	+,N	T/C-GC/MS		0.42	1.7					0.0040/0.0007
23	*1,1,2-Trichloroethane	+	V	G,N,F7	T/C-GC/MS		0.38	2.1			$1.6x10^{-5}$	.062/0.01136	0.1240/0.0227
24	*Chlordane	+	P	N,NT	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0.01	$3.7x10^{-4}$	.0027/0.00016	0.0054/0.0003
25	*1,1,2,2-Tetrachloroethane	+	V	G,+,F7	T/C-GC/MS		0.66	6.5			$5.8x10^{-5}$	.017/0.002476	0.0340/0.0005
26	Barium		M	N,NT	F-ICAP, F-XR				0				0.0200/0.0036
27	Ethylbenzene	+	V	+,N	T/C-GC/MS		0.44	1.6					0.0152/0.0035
28	*PCBs	+	P	N,NT	PUF/XAD^{-2}-GC/MS, PUF/XAD^{-2}-HRGC/HRMS		(b)	(a)		$1.0x10^{-6}$	$1.2x10^{-3}$	0.00083	0.001
29	*Asbestos	+	V	N	F-MICR.						$2.4x10^{-1}$	0.000004	
30	*Toxaphene	+	P	N	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0.01	$3.2x10^{-4}$	.0031/0.0001832	1.4470/0.0855
31	*Methylene chloride	+	V	+,N	T/C-GC/MS		0.73	(a)			$4.1x10^{-6}$	2.44/0.70235	4.8800/1.4047
32	Manganese	+	M	N,NT	F-ICAP, F-XR				0				16.6000/7.3878
33	1,2,4-Trichlorobenzene	+	V	N,+,F7	T/C-GC/MS		(b)	(c)					18.0000/2.4253
34	*Styrene	+	V	+,N	T/C-GC/MS		0.45	0.13			$2.9x10^{-7}$	3.48/0.81703	0.0007/0.0002
35	1,1-Dichloroethane	+	V	+,N	T/C-GC/MS		0.51	5.7					1000.0000/247.04

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(ug/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD-2 (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
37	Napthalene	+	S V	N,G,NT	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MSS(XAD^{-2})-HPLC/UV		(b)	(c)		0			14.2570/2.7199
38	*Ethylene oxide	+	V	N	CT-GC/ECD, CT-GC/FID		(b)	(a)			$1.0x10^{-4}$	0.01/0.00557	0.02
39	Toluene	+	V	+,N	T/C-GC/MS		0.4	2					10.2490/2.7199
40	Xylenes (o, m and p)	+	V	+,N,F7	T/C-GC/MS		0.31	0.5					11.8100/2.72
41	1,2-Dichloropropane	+	V	+,N	T/C-GC/MS		0.34	4					
42	1,2-Dichlorobenzene		V	G,+,F7	T/C-GC/MS		0.32	12.4					81.8330/13.6101
43	1,2-Dibromoethane		V	+	T/C-GC/MS			3.3					2.462/0.3204
44	*1,3-Butadiene	+	V	+	T/C-GC/MS		0.66	(a)			$4.6x10^{-7}$	2.17/0.98089	4.2000/1.8985
45	Thallium		M	N,NT	F-ICAP, F-GFAA, F-XR				0.0209				0.5700/0.0854
46	Zinc		M	N,NT	F-ICAP, F-AA, F-XR				0.002				18.00/6.7314
47	Copper		M	N,NT	F-ICAP, F-AA, F-XR				0				5.00/2.1930
48	*Propylene oxide	+	V	N	CT-GC/FID, CT-GC/MS		(c)	(a)			$1.2x10^{-4}$	.0083/0.00349	1.66
49	Acetone		V	+,N,F7	T/C-GC/MS, SEP-IC	0.0237	3.3	(c)					160.0/67.3554
50	Chloroethane		V	G,+,N,F7	C-GC/ECD, T/C-GC/MS, CT-GC/MS		0.37	(c)					718.0590/272.1
51	Phenol	+	S V	N	IMP-HPLC		(c)	(c)					20.015
52	3,3-Dichlorobenzidine	+	S V	N	F/SG-HPLC/UV		(b)	(a)					0.197
53	*2,3,7,8-tetrachlorodibenzo-p-dioxin	+	S V	N	PUF/XAD^{-2}-HRGC/HRMS		(b)	(a)		$1x10^{-6}$	$3.3x10^{-5}$	.026/0.0019745	0.06
54	2-Butanone	+	V	+,N	T/C-GC/MS			(c)					
55	*Nitrobenzene	+	S V	N	T-GC/MS, PUF/XAD^{-2}-GC/MS		(c)	(c)			$1.2x10^{-7}$	8.33/1.654362	4.0000/0.7944
56	*Dieldrin/Aldrin		P	N,NT	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0.01	$4.6x10^{-3}$	.00021/0.0000141	0.0004
57	Hexachlorocyclopentadiene	+	S V	N	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0			0.1200/0.0108
58	Acrolein	+	V	N	T/C-GC/MS, SEP-IC	0.0229	(b)	(a)		0			0.3000/0.1308
59	*Hexachlorobenzene	+	S V	N,NT	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0	$4.9x10^{-4}$	.002/0.0001717	0.0040/0.0003
60	Antimony	+	M	N,NT	F-ICAP, F-AA, F-XR				0.002				1.3390/0.2689
61	*Benzyl chloride	+	V	N,+,F7	T/C-GC/MS		(c)	(c)			$1.2x10^{-5}$	.063/0.016031	1.6800/0.3631
62	*Pentachlorophenol	+	S V	N	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0.173	$3.9x10^{-7}$	2.56/0.234999	5.0000/0.4590
63	Carbon Disulfide	+	V	N	C-GC/MS, GB-GC/MS, ACM		(c)	(a)					0.27/0.0867
64	*4,4-DDE,DDT,DDD	+	P	N,NT	PUF/XAD^{-2}-GC/ECD, PUF/XAD^{-2}-GC/MS		(b)	(a)		0.002	$9.7x10^{-5}$	.0103/0.00079	2.0600/0.1421
65	Hydrogen fluoride	+	V	N,G	DENUDER-IC, S(SILICA GEL)-HPLC/UV ACM		(b)	(a)					0.679
66	4-Methyl-2-pentanone	+	V	N,+,F7	SEP-IC, T/C-GC/MS		(c)	(c)					53.9100/13.16
67	Cobalt	+	M	N,NT	F-ICAP, F-XR		(c)		0.004				0.57/0.2365
68	Nickel carbonyl		V		F/CT-GFAA			(a)					
69	Cis-1,3-Dichloropropene	+	V	G,N	T/C-GC/MS		0.53	(c)					
70	Phosgene	+	V		IMP-HPLC, ACM			(a)					0.485

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(UG/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-5} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD-2 (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
72	Nickel		M	N,NT	F-ICAP, F-AA, F-XR								
73	Hydrazine	+	V		S(FIRBK)-HPLC/UV								
74	Fluorene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, S(XAD^{-2})-HPLC/UV		(b)	(a)		0			
75	1,4-Dichlorobenzene	+	V	G	T/C-GC/MS		0.12/0.79	0.5					0.3610/0.0600
76	1,4-Dioxane	+	V	+	T-GC/MS		0.9	3.9					0.4800/0.1332
77	Nickel sulfide		M	N	IMP-COL								
78	Ammonia		V	N,G	DENUDER-IC, ACM		(b)	(a)					4.736
79	*Epichlorohydrin	+	V	N	T-GC/MS		(c)	(c)			$2.7x10^{-6}$	.370/0.097768	
80	*Acetaldehyde	+	V	N	IMP-HPLC/UV, SEP-IC	0.02					$2.2x10^{-6}$	0.45/0.249773	
81	Aniline	+	S V	N	IMP-COL., PUF-GC/MS		(c)	(c)					
82	*Hexachlorobutadiene	+	V	G	C-GC/MS		(c)	(c)			$2.2x10^{-5}$	0.045	2.9
83	Methyl isocyanate	+	V		S(XAD^{-7})-HPLC/UV		(b)	(a)					
84	Toluene diisocyanate	+	S V	N	GB-GC/FID		(b)	(a)					
85	Silver		M	N,NT	F-ICAP, F-AA, F-XR				0				0.5690/0.1626
86	Bromomethane	+	V	+,N	T/C-GC/MS, CT-GC/MS		0.64	7.8					60.0000/15.4502
87	Ethylenimine		V		IMP-HPLC		(c)	(a)					
88	Trans 1,3-Dichloropropene	+	V	G,N	T/C-GC/MS		0.4	(c)					
89	Methoxychlor	+	P	N	PUF-GC/ECD, PUF-GC/MS		(b)	(a)		0.01			56.9720/4.0300
90	Dichlorodifluoromethane		V	+	C-GC/MS, CT-GC/MS		(c)	(c)					0.0300/0.0061
91	Parathion	+	P	N	PUF-GC/MS, PUF-GC/ECD, PUF-GC/NPD		(b)	(a)		0			0.57/0.0478
92	Hydrogen sulfide		V	G	IMP-COL., GB-GC/FPD, ACM		(c)	(a)					3.79
93	*Chloromethane	+	V	G,+,F7	C-GC/MS, CT-GC/MS		0.39	(a)			$1.8x10^{-6}$	0.555/0.26876	11.1000/5.3752
94	*n-Nitrosodimethylamine	+	V	N	ADS-GC/MS, S(TN)-GC/HECD		(c)	(c)			$5.4x10^{-3}$	0.00018/0.0000594	
95	Benzo(b)fluoranthene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS,PUF-GC/MS, PUF-GC/FID, S(XAD^{-2})-HPLC/UV		(b)	(a)		0			
96	Radon	+	V	N	CT-RAD.								
97	Cis-1,2-Dichloroethylene		V	G,N	T/C-GC/MS		0.06/0.25	(c)					
98	Fluorides/fluorine/HF		V	N,G	DENUDER-IC, S(SILICA GEL)-IC, ACM								6.807
99	Sulfur Dioxide		V	G	IMP-COL., GB-GC/FPD, ACM		(c)	(a)					28.500/2.7568
100	Methanol	+	V	G	T/C-GC/MS, TC-GC/FID		20	(a)					
101	Bromodichloromethane		V	G,+,F7	T/C-GC/MS		0.48	(c)					
102	Hydrogen Arsenide		V	N	CT-GFAA								
103	Tribromomethane	+	V	N,+,F7	T/C-GC/MS		0.48	(a)					28.5
104	Acetonitrile	+	V	+	T-GC/MS		(c)	(c)					100.0000/59.5615
105	1,3-Dichlorobenzene		V	G	T/C-GC/MS		0.07/0.44	(a)					

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(UG/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD^{-2} (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
107	Benzo(a)anthracene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, S(XAD^{-2})-HPLC/UV		(b)	(a)		0			
108	Pyridine		V	+	T-GC/MS,S(XAD^{-2})-GC/MS		(c)	(c)					4.000/1.2364
109	BHC		P	N,NT	PUF-GC/ECD, PUF-GC/MS					0.01			
110	Endosulfon		P	N	PUF-GC/ECD, PUF-GC/MS		(b)	(a)					0.5690/0.0342
111	Mechloroethamine		V										
112	*3-chloro-1-propene	+	V	N	T/C-GC/MS,CT-GC/MS		(c)	(c)			$5.5x10^{-8}$	18.18	363.6000/116.1639
113	Dibenzo(a,h)anthracene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF-GC/MS, PUF-GC/FID, S(XAD^{-2})-HPLC/UV					0			
114	Boron		M	N,NT	F-ICAP, F-XR				0.004				
115	Benzo(k)fluoranthene		S V	N,NT	PUF/XAD^{-2}-GC/MS, PUF-GC/FID, S(XAD^{-2})-HPLC/UV					0			
116	Dibromochloromethane		V	G,+,N,F7	T/C-GC/MS		0.27	(c)					
117	Endrin aldehyde/endrin		P	N,NT	PUF-GC/ECD, PUF-GC/MS					0.01			0.57
118	Methyl Methacrylate	+	V	N	T-GC/MS,C-GC/MD								
119	Anthracene		S V	N,NT	PUF/XAD^{-2}-HPLC, PUF-GC/MS, PUF-GC/FID, S(XAD^{-2})-HPLC/UV					0			
120	Mirex		P	N,NT	T-GC/MS,PUF-GC/ECD,PUF-GC/MS					0.01			
121	Dibromochloropropane		V	N	C/T-GC/MS								
122	Tetrahydrofuran		V	N	T-GC/MS, PUF-GC/MS, PUF-HRGC/HRMS, C-GC/MD			1.2					160.478
123	Bromoethane		V	N	T/C-GC/MS		(b)	(c)					
124	2-chloro-1,3-Butadiene	+	V	G	T/C-GC/MS		0.38						0.98/0.3132
125	Vinyl Acetate	+	V	N	C-GC/MS		(c)	(c)					38.3090/10.88
126	Sulfuric Acid		S V	N	DENUDER-IC, B-HPLC, ACM								2.728
127	4-Chloroaniline		S V	N	PUF-GC/MS								
128	Di(Chloromethyl)ether		V										
129	Thorium		M	N	F-ICAP, F-XR				0.008				
130	*Trans-1,4-Dichlorobutene		V		T-GC/MS		(c)	(c)			$2.6x10^{-3}$	0.00038	
131	Bromochloromethane		V	G	T/C-GC/MS		0.67	2.1					30.165
132	*Benzidine	+	S V	N	F-HPLC/UV,PUF-GC/MS						$6.7x10^{-2}$	.000015/0.000002	
133	Methacrylonitrile		V	N	T-GC/MS,C-GC/MD								
134	Propylene		V	G	T-GC/FID,T/C-GC/MS		0.29						
135	1,1,2-Trichloro-1,2, 2-trifluoroethane		V	+	T/C-GC/MS								
136	Acenaphthylene		S V	NT	PUF/XAD^{-2}-GC/MS					0.003			
137	Benzo(g,h,i)Perylene		S V	N	PUF-GC/ECD, PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS,S(XAD^{-2})-HPLC/UV		(b)	(c)		0			

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(UG/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD^{-2} (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
139	Hydrogen Cyanide	+	V	N	IMP.-COL., IMP-IC, ACM								66
140	Aldicarb		P	N	PUF-HPLC, PUF-GC/MS, PUF-GC/ECD, SEP-IC, SEP-HPLC					0.003			4
141	Furfural		V	N	T-GC/MS,PUF-GC/MS								
142	Phenanthrene		S V	N	PUF/XAD^{-2}-GC/MS, PUF/XAD^{-2}-HPLC, PUF-GC/ECD, S(XAD^{-2})-HPLC/UV					0			
143	1,1-Dimethylhydrazine		V										
144	Zinc Oxide		M	N	F-ICAP, F-XR				0.001				
145	Polybrominated biphenyls		P	N	PUF/XAD^{-2}-GC/MS,PUF-GC/ECD					$1x10^{-6}$			
146	Pyrene		S V	N	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, PUF-GC/ECD, S(XAD^{-2})-HPLC/UV					0			
147	Trichlorofluoromethane		V	+	T/C-GC/MS,CT-GC/MS		(c)	(c)					
148	1,2,3-Trichloropropane	+	V	N	T-GC/MS		(c)	4.7					
149	1,2-Diphenylhydrazine	+	S V		F/IMP-HPLC/UV								
150	Uranium		M	N	F-ICAP								
151	*2,4,6-Trichlorophenol	+	S V	N	PUF-GC/ECD,PUF-GC/MS,PUF-GC/ECD					0.01	$5.7x10^{-6}$	.175/0.02167	
152	2,4-Dinitrotoluene	+	S V	N	T-GC/MS,PUF-GC/MS								
153	2,4-Dichlorophenol		S V	N	T-GC/FID,T-GC/MS								
154	Isopropylbenzene	+	V	G	T/C-GC/MS								
155	Methylene bis(phenyl isocyanate)		S V	N									
156	Indeno(1,2,3-cd)pyrene		S V	N	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, PUF-GC/ECD, S(XAD^{-2})-HPLC/UV					0			
157	Tin		M	N	F-ICAP, F-XR				0.03				
158	Molybdenum		M	N	F-ICAP, F-XR				0				
159	Dibenzofuran	+	S V	N	PUF/XAD^{-2}-GC/MS, PUF/XAD^{-2}-HPLC, PUF-GC/ECD					$1x10^{-6}$			
160	Cresols	+	S V	N	IMP-HPLC								24.061
161	Chrysene		S V	N	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, PUF-GC/ECD, S(XAD^{-2})-HPLC/UV					0			
162	2-Methoxyethanol		V	N	C-GC/MD								
163	Heptane		V	G	T/C-GC/MS		0.17/0.76						
164	Acetic Anhydride		V		IMP-COL.								
165	Malathion		P	N	PUF-GC/MS, PUF-GC/ECD, PUF-GC/NPD, PUF-GC/FPD					0.01			
166	*Hexachloroethane	+	S V	N	T-GC/FID, PUF-GC/MS, S(XAD^{-2})-GC/MS						$4.0x10^{-6}$	0.25/0.0258	
167	2,4,5-Trichlorophenol	+	S V	N	PUF/XAD^{-2}-GC/ECD,PUF/XAD^{-2}-GC/MS PUF-HPLC					0.07			

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(UG/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD-2 (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
169	Dialkyl nitrosoamines		V	N	S(TN)-GC/NPD,S(TN)-GC/HECD								
170	Diethylphthalate		S V	N	PUF-GC/MS,S(XAD^{-2})-GC/MS								
171	Maleic anhydride	+	S V		S(XAD^{-2})-HPLC/UV								
172	2-Chlorophenol		V	N	S(SILICA GEL)-HPLC/UV								
173	2-Chloropropane		V	N	T/C-GC/MS			3.4					
174	Strontium		M	N	F-ICAP, F-XR				0.002				
175	Ethylene diamine		V		S(TN)-GC/NPD								
176	Chlorodibenzodioxins		S V	N	PUF-HRGC/HRMS					$1x10^{-5}$			
177	B-Napthylamine		S V	N	IMP-HPLC,PUF-GC/MS								
178	Bis(2-Ethylhexyl)phthalate		S V	N	PUF-GC/MS,S(XAD^{-2})-GC/MS								
179	2-Chloroethyl vinyl ether		V	N	T-GC/MS								
180	2-Ethoxyethanol		V		CT-GC/FID								
181	n-Nitrosodiphenylamine		S V	N	S(TN)-GC/NPD								
182	Octane		V	G	T/C-GC/MS		0.05/0.28						
183	Chlorodifluoromethane		V	G	C-GC/MS,CT-GC/MS								
184	Isophorone	+	S V	N	T-GC/MS, PUF-GC/MS,S(XAD^{-2})-GC/MS								
185	2,4-D Salts & esters	+	S V	N	F-HPLC/UV								
186	*Di(n-octyl)phthalate		S V	N	PUF-GC/MS,S(XAD^{-2})-GC/MS							7.69/0.48148	
187	Nitrophenol	+	S V	N	PUF-GC/MS,S(XAD^{-2})-GC/MS								
188	Acenaphthene		S V	N	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, PUF-GC/FID					0			
189	Bis(2-chloroethyl)ether		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
190	Bromobenzene		V	N	T-GC/MS			14.1					
191	Benzoic acid		S V	N	S(XAD^{-2})-GC/MS								
192	Butylbenzylphthalate		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
193	Fluoranthene		S V	N	PUF/XAD^{-2}-HPLC, PUF/XAD^{-2}-GC/MS, PUF-FID, S(XAD^{-2})-HPLC/UV					0			
194	Disulfoton		P	N	PUF-GC/ECD, PUF-HPLC, PUF-GC/NPD, PUF-GC/FPD, PUF-GC/MS					0.01			
195	Methyl styrene		V		T/C-GC/MS								
196	2-Nitrophenol		S V	N	PUF-GC/ECD,PUF-GC/MS,PUF-HPLC					0.01			
					S(XAD^{-2})-GC/MS								
197	2,4-Dimethyl phenol		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
198	Plutonium		M										
199	Benzaldehyde		V	N	SEP-IC,B-HPLC/UV	0.0433		5.9					
200	Dicyclopentadiene		S V	N	CT-GC/FID,S(XAD^{-2})-GC/MS								
201	4-Chlorophenyl phenyl ether		V										

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSIFICATION (3)	STD's Avail (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(ug/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) (ug/m^3)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD-2 (f)			
	(Abbreviation explanation at end of table)					ug/m^3	ppb	ng	ug/m^3	ug/m^3		ug/m^3/ppb	
203	2,6-Dinitrotoluene		S V	N	F/IMP-HPLC/UV,S(XAD-2)-GC/MS								
204	Benzonitrile		S V	N	T-GC/MS,S(XAD-2)-GC/MS			1.3					
205	Ethylene glycol	+	S V	N	F/CT-GC/FID								
206	2,4-Dinitrophenol	+	S V	N	S(XAD-2)-GC/MS,PUF-GC/MS								
207	n-Nitroso-n-propylamine		S V	N	S(TN)-GC/HECD								
208	1,2-Dimethylhydrazine		V										
209	Radium		M	N	F-ICAP,Radiochemical Method								
210	Tritium		V		F-ICAP, F-XR								
211	2-Nitroaniline		S V	N	S(XAD-2)-GC/MS,PUF-GC/MS								
212	3-Nitroaniline		S V	N	S(XAD-2)-GC/MS,PUF-GC/MS								
213	Coke oven emissions	+	S V										
214	n-Pentane		V	G	T/C-GC/MS		0.26/0.85						
215	2-Hexanone		V	N	SEP-IC,T-GC/MS,B-HPLC/UV								
216	4-Nitrodiphenyl	+	S V	N	IMP-HPLC/UV, S(XAD-2)-GC/MS, PUF-GC/MS								
217	p-Biphenylamine		S V	N	S(XAD-2)-GC/MS,PUF-GC/MS								
218	Carbaryl	+	P	N	F-HPLC/UV								
219	2,4,5-trichlorophenoxyacetic acid	+	P	N	F-HPLC/UV								
220	Auramine		P		F-HPLC/UV								
221	*Coal Tars		S V		PUF-HPLC/UV					$1x10^{-6}$	$6.2x10^{-4}$	0.0016	
222	Di-(n-butyl)phthalate		S V	N	S(XAD-2)-GC/MS/PUF-GC/MS								
223	Creosote		S V		IMP-HPLC, PUF-HPLC, PUF-GC/MS, PUF-GC/FID					0.001			
224	Dimethylformamide	+	V	N	S(SILICA GEL)-GC/FID								
225	Atrazine		P	N	F-HPLC/UV,PUF-HPLC/UV								
226	Acetophenone	+	S V	N	T-GC/MS,SEP-IC, PUF/XAD-2-HPLC					0			
227	Di(2-Chloroethoxy)methane		S V	N	PUF-GC/MS,S(XAD-2)-GC/MS								
228	Ethylene glycol monobutyl ether		V										
229	Cyclopentadiene		V		S(CHROMO 104)-GC/FID								
230	Nitrates/nitrites		S V	N	DENUDER-IC								
231	4,6-dinitro-2-methylphenol		S V	N	S(XAD-2)-GC/MS/PUF-GC/MS								
232	Hexane	+	V	G	T/C-GC/MS		0.06/0.23						
233	Cyclohexanone		V	N	SEP-IC,T-GC/MS,B-HPLC/UV								
234	Cyclohexylamine		V	N	S(SILICA GEL)-GC/NPD								
235	Dimethylphthalate	+	S V	N	S(XAD-2)-GC/MS/PUF-GC/MS								
236	Acetone Cyanohydrin		S V	N	S(PORAPAK-QS)-GC/NPD								

Table G-1. (Continued)

Ranking (1)	Air Toxics (2)	CAA of 1990	CLASSI-FICATION (3)	STD's Avail. (4)	AVAILABLE SAMPLING/ANALYTICAL METHODS (6)	DEMONSTRATED SAMPLING METHODOLOGY (5) AND APPROACHABLE METHOD DETECTION LIMITS (7)					UNIT RISK SLOPE ($(\mu g/m^3)^{-1}$)	APPROXIMATE AIR RISK SPECIFIC CONCENTRATION AT 10^{-6} (8)	REFERENCE AMBIENT LEVELS (RALs) ($\mu g/m^3$)/ppb (9)
						Sep-PAK	Canister (d)	Tenax	Filter (e)	PUF/XAD^{-2} (f)			
	(Abbreviation explanation at end of table)					$\mu g/m^3$	ppb	ng	$\mu g/m^3$	$\mu g/m^3$		$\mu g/m^3$/ppb	
238	1-bromobutane		V		T-GC/MS								
239	1-Bromo-4-phenoxybenzene		V										
240	4-chloro-3-methylphenol	+	S V	N	B-COL.,S(XAD^{-2})-GC/MS								
241	2,4,5-TP		P	N	IMP-GC/ECD								
242	Phthalic anhydride	+	S V	N	F-HPLC/UV								
243	Pentachlorobenzene		P	N	F/S-GC/ECD/PUF/XAD^{-2}-GC/MS								
244	4,4-Methylene-bis-(2-chloraniline)	+	S V	N									
245	Propylene glycol monomethyl ether		V	N									
246	4-Methyl phenol		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
247	2-Methyl phenol		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
248	Benzyl alcohol		S V	N	S(XAD^{-2})-GC/MS,PUF-GC/MS								
249	2-Methylnapthalene		S V	N	T-GC/MS, S(XAD^{-2})-GC/MS, PUF-GC/MS					0			
250	*Nitrosomorpholine	+	V	N	S(TN)-GC/HECD						2.5×10^{-5}	0.040/0.008423	
251	2,4,6-Trinitrotoluene		S V	N	F-GC/NPD,S(XAD^{-2})-GC/ECD								
252	2,4,6-Trinitrophenylmethyl-nitamine		S V	N									
253	cyclonite		S V		F-HPLC/UV								
254	Nitrosobenzene		S V										
255	Ethylene cyanohydrin		S V										
256	Propylene glycol		S V	N									
257	1,3,5-Trinitrobenzene		S V	N	S(XAD^{-2})-GC/MS								

(a) Not Amenable to Tenax Analysis

(b) Not Amenable to Canister Analysis

(c) No Detection Limits Available, but Feasible

1 Reference to 40CFR 60.130

2 Based on 10 L Samples

Abbreviations for Table G-1, EPA's Superfund Target Compound List

(1) As determined by EPA's RIA, discussed in Chapter 3.

(2) Those toxics that have unit risk numbers developed by U.S. Environmental Protection Agency and other agencies are indicated by an asterisk.

(3) Classification

V =	Volatile air toxic compounds having vapor pressure above 10^{-1} mm Hg at standard conditions (20°C and 760 mm Hg).
SV =	Volatile air toxic compounds having vapor pressure between 10^{-1} and 10^{-7} mm Hg at standard conditions (20°C and 760 mm Hg).
P =	Those air toxics retained on filter material, either glass fiber or Teflon©, during sampling.
M =	Airborne particulate with metallic constituents.

(4) Available standards.

+	U.S. EPA, Quality Assurance Division, AREAL, RTP, NC, Group 5/6 gas standards.
N	Neat solution available from manufacturers.
G	Gas cylinder standards produced and validated by consultants under EPA contract.
NT	National Institute of Standards and Technology (NIST) solutions available.
F7	U.S. EPA, Quality Assurance Division, AREAL, RTP, NC, Future Group 7 gas standards.

(5) Notation

Sep-PAK©	Silica gel impregnated with 2,4-Dinitrophenylhydrazine for extracting aldehydes and ketones from air.
Canister	SUMMA© passivated stainless steel canister for collecting whole air samples.
Adsorbent	Solid adsorbents, typically Tenax-GC
Filter	Filter material, either glass fiber, Teflon or nylon, used to retain particles.
PUF	Polyurethane foam for retaining semi-volatile pollutants.
IC	Ion chromatography analysis using conductivity detector.
GC/MS	Gas chromatography/mass spectroscopy analysis, applicable to both canisters and solid adsorbents.
ICAP	Inductively coupled argon plasma spectroscopy analysis, applicable for metal analyses.
HPLC	High performance liquid chromatography using ultraviolet detector.

(6) Available sampling/analytical notation

ACM	Ambient continuous monitor.
ADS-AA	Solid adsorbent sampling followed by flameless atomic adsorption analysis.
ADS-GC/MS	Solid adsorbent sampling followed by gas chromatography/mass spectroscopy analysis.
C-C/MS	Canister sampling followed by chromatography/mass spectroscopy analysis.

C-GC/MS	Canister sampling by gas chromatography/mass spectroscopy analysis.

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Abbreviations for Table G-1 (continued).

CT-GC/ECD	Activated charcoal tube sampling followed by gas chromatography with electron capture.
CT-GC/FID	Activated charcoal tube sampling followed by gas chromatography with flame ionization.
CT-GFAA	Activated charcoal tube adsorbent followed by radiochemistry
CV-AA	Filter sampling followed by cold vapor atomic adsorption spectroscopy.
DI-ICAP	Dichotomous sampling followed by inductively coupled argon plasma spectroscopy analysis.
Denuder-IC	Annual Denuder sampling followed by ion chromatographic analysis.
F-AA	Filter sampling followed by atomic adsorption spectroscopy.
F-GC/NPD	Filter sampling followed by gas chromatography separation with nitrogen-phosphorus detection.
F-GFAA	Filter sampling followed by graphite furnace atomic adsorption spectroscopy.
F-HPLC/UV	Filter sampling followed by high performance liquid chromatography with ultraviolet detection.
F-ICAP	Filter sampling followed by inductively coupled argon plasma spectroscopic analysis.
F-Micr	Filter sampling followed by microscopic analysis.
F/CT-GFAA	Filter/activated charcoal tube sampling with graphite furnace atomic absorption spectroscopy analysis.
F/CT-GC/FID	Filter/activated charcoal tube sampling followed by gas chromatography with flame ionization detection.
F/Imp-HPLC/UV	Filter/impinger sampling followed by high performance liquid chromatography with ultraviolet detection.
F/SG-GC/FID	Filter/silica gel adsorbent followed by gas chromatography with flame ionization detection.
F/SG-HPLC/UV	Filter/silica gel sorbent followed by high performance liquid chromatography with ultraviolet detection.
GB-GC/FID	Glass bulb sampling followed by gas chromatography separation with flame ionization detection.
GB-GC/FPD	Glass bulb sampling followed by gas chromatography separation with flame photometric detection.
GB-GC/MS	Glass bulb sampling followed by gas chromatography separation with mass spectroscopy identification.
Imp-COL	Impinger sampling followed by colorimetric analysis.
Imp-HPLC	Impinger sampling followed by high performance liquid chromatography.

PUF-GC/ECD	Polyurethane foam of XAD-2 sampling followed by a gas chromatography separation with electron capture detection.
PUF-GC/FID	Polyurethane foam sampling followed by gas chromatography separation with flame ionization detection.

Abbreviations for Table G-1 (continued).

PUF-GC/FPD	Polyurethane foam sampling followed by gas chromatography separation with flame photometric detection.
PUF-GC/MS	Polyurethane foam sampling followed by gas chromatography/mass spectroscopy analysis.
PUF/XAD-2-GC/MS	Polyurethane foam combined with XAD-2 resin for sampling followed by gas chromatography/mass spectroscopy analysis.
PUF-GC/NPD	Polyurethane foam sampling followed by high performance liquid chromatography.
PUF-HRGC/HRMS	Polyurethane foam sampling followed by high resolution gas chromatography with high resolution mass spectroscopy
S(Chromo 104)-GC/FID	Sorbent (chromosorb 104) sampling followed by gas chromatography separation with high resolution mass spectroscopy.
S(firbk)-HPLC/UV	Sorbent (firebrick) sampling followed by high performance liquid chromatography analysis.
S(Porapak-QS)-GC/NPD	Sorbent (Porapak-QS) sampling followed by gas chromatography eparation with nitrogen-phosphorus detection.
S(silica gel)-GC/FID	Adsorbent (silica gel) sampling followed by gas chromatography separation with flame ionization detection.
S(silica gel)-GC/FID	Adsorbent (silica gel) sampling followed by gas chromatography separation with flame ionization detection.
S(silica gel)-HPLC/UV	Sorbent (silica gel) sampling followed by high performance liquid chromatography with ultraviolet detection.
S(TN)-GC/HECD	Sorbent (Thermosorb N) sampling followed by gas chromatography separation with Hall electron capture detector.
S(TN)-GC/NPD	Sorbent (Thermosorb N) sampling followed by gas chromatography separation with nitrogen phosphorus detection.
S(XAD-2)-HPLC/UV	Sorbent (XAD-2) sampling followed by high performance liquid chromatography analysis.
S(XAD-7)-HPLC/UV	Sorbent (XAD-7) sampling followed by high performance liquid chromatography analysis.
SEP-HPLC	Sep-PAK© impregnated cartridge sampling followed by high performance liquid chromatography.
SEP-IC	Sep-PAK© impregnated cartridge sampling followed by ion chromatography analysis.
T-GC/MS	Tenax solid adsorbent tube sampling followed by gas chromatography/mass spectroscopy analysis.

T/C-GC/MS	Tenax solid adsorbent tube or canister sampling followed by gas chromatography/ mass spectroscopy analysis.

(7) Detection limits

(a) Not amenable to Tenax analysis.

(b) Not amenable to canister analysis.

(c) No detection limits available, but feasible.

(d) Canister - GC/MS in the SIM mode, Hewlett-Packard 5988A, column: 30 m x 0.32 i.d., DB-624 fused silica capillary, Perma Pure Dryer, 200 mL cryotrap sample, seven replicate samples analysis, LDD = (std. DEV.) x (one-tailed Student's value at 99% level).

(e) Detection limit based upon 2500 m^3 of air sampled, through a 8" x 10" glass filter with a 0.75" x 1" strip analyzed in final sample volume of 40 mL acid extraction solution.

(f) PUF - Amount of air sampled determines MDLs. MDL based upon 273 m^3 of theoretical air sampled, evaporate to 1 mL and analyze 1 µL by GC/MS/SIM.

(8) Approximate Air Risk Specific Concentration = [Acceptable Risk Level (i.e., 10^{-6})]/[Unit Risk Factor].

(9) Reference Ambient Levels (RALs) were developed from state agency acceptable ambient levels (AALs) as approximations of potential Applicable or Relevant and Appropriate Requirements (ARARs) or "To-Be-Considered" materials (TBCs) in establishment of air cleanup standards for remedial actions at national Priority List (NPL) sites.